	Module Description/Course Syllabi
	Study Programme : Magister of Mathematics Faculty of Mathematics and Natural Sciences. Universitas Andalas

1. *Course number and name*

MAT82231 Statistics Theory

2. *Credits and contact hours/Number of ECTS credits allocated*

3 / 4,50 ECTS

3. *Instructors and course coordinator*

1. Prof. Dr. Ferra Yanuar, M.Sc

4. *Text book, title, outhor, and year*

a.   Roussas, G. 2003. *Introduction to Probability and Statistical Inference*. Academic Press.

b.   Hoog RV , McKean JW, Craig AT. 2005. *Introduction to Mathematical Statistics* 6 th *Edition*. Pearson Prentice Hall.

5. *Recommended reading and other learning resources/tools*

1. Wackerly D, Mendenhall W, Scheaffer RL. 2007. *Mathematical Statistics with Applications* 7 *th Edition*, Duxbury Thomson Learning.

6. *Specific course information*

A. Brief description of the content of the course (catalog description)

In this course material is provided on basic concepts related to random variables and their distribution, transformation of one random variable, transformation of two or more random variables, the concept of order statistics, the concept of transformation of the t and F distribution, the concept of convergence and probability distribution, the concept of hypothesis testing and interval estimation. To increase understanding and provide simple research experience to students, this lecture is also equipped with a final project, namely implementing selected statistical methods on simple data and then presenting them individually (selected topics only).

B. Prerequisites or co-requisites

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C. Indicate whether a required or elective course in the program

Required

D. Level of course unit (according to EQF: first cycle Bachelor, second cycle Master)

Second Cycle master

E. Year of study when the course unit is delivered (if applicable)

1st Year

F. Semester when the course unit is delivered
Second Semester
G. Mode of delivery (face-to-face, distance learning)
Mixture (Face to face and Distance learning)
7. *Intended Leening Outcomes*

ILO-2: Mastering mathematical concepts and applications (real analysis, advanced linear algebra, and statistics) in solving complex mathematical problems.
    PI-1: Able to explain mathematical concepts (Real Analysis, Advanced Linear Algebra, and Statistics).
    PI-2: Able to identify complex mathematical problems.
ILO-3: Able to master one or several mathematical problems in analysis, algebra, applied mathematics, statistics and combinatorics.
    PI-1: Able to identify theories used in related mathematical problems.
    PI-2: Able to apply theories for advancement in related fields (advanced theory).
    PI-3: Able to use advanced theory to solve related mathematical problems.
ILO-4: Mastering scientific techniques and developing them in solving research problems through multidisciplinary or interdisciplinary approaches.
    PI-1: Able to apply mathematical techniques in research problem-solving.
    PI-2: Able to analyse research problems.
    PI-3: Able to formulate theorems/models and prove their validity.
    PI-4: Able to use various mathematical software to solve complex mathematical problems.

8. *Course Learning Outcomes ex. The student will be able to explain the significance of current research about a particular topic.*
1. Students are able to explain basic concepts related to random variables and their distribution. 2. Students are able to analyze the concept of transformation of one and two random variables. 3. Students are able to analyze the concept of regulatory statistics. 4. Students are able to analyze the concept of t and F distribution transformations. 5. Students are able to explain and analyze the concepts of convergence and distribution of opportunities. 6. Students are able to use the concept of hypothesis testing. 7. Students are able to use the concepts and stages of interval estimation. 8. Students are able to reason intuitively and analytically and are able to express the results of their reasoning in writing, systematically and rigorously.
9. *Brief list of topics to be covered*
1. Random variables and their distribution. 2. Transformation of one and two random variables.

3. Ordered statistics.

4. Transformation of t and F distribution.

5. Convergence and distribution of probability.

6. Hypothesis testing.

7. Interval estimation.

10. Learning and teaching methods
Presentation, Small Group Discussion, Directed Learning.

11. Language of instruction
Bahasa Indonesia

12. Assessment methods and criteria

Summative Assessment :
1. Activeness : 10%
2. Project : 10%
3. Quiz : 20 %
4. Mid Semester : 30%
5. Final Semester : 30%

Formative Assessment:
1. Thumb up and thumb down
2. Minutes paper